

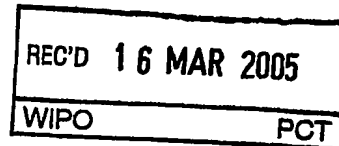
PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)



Applicant's or agent's file reference P205794PCT YGR/do	FOR FURTHER ACTION See Form PCT/PEA/416	
International application No. PCT/NL2004/000003	International filing date (day/month/year) 06.01.2004	Priority date (day/month/year) 06.01.2003
International Patent Classification (IPC) or national classification and IPC F16M7/00		
Applicant MACHINE SUPPORT B.V. ET AL		
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p style="margin-left: 20px;">a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau) a total of 6 sheets, as follows:</p> <p style="margin-left: 40px;"><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p style="margin-left: 40px;"><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p style="margin-left: 20px;">b. <input type="checkbox"/> (sent to the International Bureau only) a total of (Indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>		
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application</p>		
Date of submission of the demand 04.08.2004	Date of completion of this report 17.03.2005	
Name and mailing address of the international preliminary examining authority: European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Das Neves, N Telephone No. +31 70 340-4879	



INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/NL2004/000003

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:

- ☐ international search (under Rules 12.3 and 23.1(b))
- ☐ publication of the international application (under Rule 12.4)
- ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

4-11 as originally filed
1-3 received on 03.11.2004 with letter of 03.11.2004

Claims, Numbers

1-18 received on 03.11.2004 with letter of 03.11.2004

Drawings, Sheets

1/3-3/3 as originally filed

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/NL2004/000003

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-18
	No: Claims	
Inventive step (IS)	Yes: Claims	1-18
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-18
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Reference is made to the following document:

D1: DE 24 05 368 A (GEMEX GMBH & CO KG) 7 August 1975 (1975-08-07)

2 The document D1 is regarded as being the closest prior art to the subject-matter of claim 1 and shows (the references in parentheses applying to this document):

2.1 Combination comprising, on the one hand, an adjustable foot for setting up equipment in alignment and, on the other hand, a tool (13) for setting the height of the adjustable foot,

wherein the adjustable foot comprises:

- a first adjustable part (3, 340) provided with an axial bore with internal screw thread (34,341);
- a second adjustable part (4, 320) provided with external screw thread (41, 325) matching the internal screw thread (34, 341), which second adjustable part (4, 320), when screwed into the bore, can be adjusted in the axial direction with respect to the first adjustable part (3, 340) by turning with respect to the first adjustable part (3, 340) and which second adjustable part (4, 320) is provided with at least one hole that runs axially;
- a support part (43, 321), provided on first adjustable part (3, 340) or second adjustable part (4, 320), and
- a washer (5, 310),

wherein the washer (5, 310) and the support part (43, 321) are each provided with a concave (51, 311), respectively, convex (43, 321) surface having essentially the same radius of curvature, such that the angle of the washer (5, 310) can be adjusted with respect to the support part (43, 321) wherein the tool (13) has an insertion end that can be inserted into the hole in the axial direction and wherein the insertion end is provided with gripper means (131) that are so equipped that, when they engage on the interior of the hole and the insertion end is rotated about the axial axis, the second adjustable part (4, 320) also turns.

- 2.2 The subject-matter of claim 1 differs from this known combination in that the convex surface is provided on the washer and the concave surface on the support part and in that the gripper means comprise driver members that are able to move back and forth in the radial direction and are fitted distributed around the periphery of the insertion end, which driver members are connected via transmission means to operating means for radially expanding and retracting the driver members for engaging on the hole, which operating means are provided on the tool and are located outside the hole when the insertion end has been inserted into the hole.
- 2.3 The subject-matter of claim 1 is therefore new (Article 33(2) PCT).
- 2.4 The problem to be solved by the present invention may be regarded as improving the adaptability of the gripper means to the hole.
- 2.5 The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:
- 2.5.1 None of the documents cited in the search report gives any hint that would lead the skilled person to the solution present in the characterizing portion of independent claim 1. Namely, the measure consisting in providing the gripper means with driver members that are able to move back and forth in the radial direction and are fitted distributed around the periphery of the insertion end, which driver members are connected via transmission means to operating means for radially expanding and retracting the driver members for engaging on the hole, which operating means are provided on the tool and are located outside the hole when the insertion end has been inserted into the hole is the result of a step that was not suggested in the cited documents.
- 2.6 The subject-matter of claim 1 has an industrial applicability.
- 3 Claims 2-18 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

Re Item VIII

**INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(SEPARATE SHEET)**

International application No.

PCT/NL2004/000003

Certain observations on the international application

- 4 The application does not meet the requirements of Article 6 PCT, because claim 12 is not clear. The reason therefor is the following:
 - 4.1 The present set of claims lacks conciseness as the additional feature of dependent claim 12 is already present in independent claim 1. Therefore claim 12 is merely a repetition of features.

Combination comprising, on the one hand, an adjustable foot for setting up equipment in alignment and, on the other hand, a tool for setting the height of the adjustable foot

The present invention relates to a combination comprising, on the one hand, an adjustable foot for setting up equipment in alignment and, on the other hand, a tool for setting the height of the adjustable foot, wherein the adjustable foot comprises:

- a first adjustable part provided with an axial bore with internal screw thread;
- a second adjustable part provided with external screw thread matching the internal screw thread, which second adjustable part, when screwed into the bore, can be adjusted in the axial direction with respect to the first adjustable part by turning with respect to the first adjustable part and which second adjustable part is provided with at least one hole that runs axially;

- a support part, provided on the first adjustable part or second adjustable part, and
- a washer,

wherein the washer and the support part are each provided with a convex, respectively, concave surface, having essentially the same radius of curvature, such that the angle of the washer can be adjusted with respect to the support part

wherein the tool has an insertion end that can be inserted into the hole in the axial direction and wherein the insertion end is provided with gripper means that are so equipped that, when they engage on the interior of the hole and the insertion end is rotated about the axial axis, the second adjustable part also turns.

An adjustable foot of such a combination is disclosed in EP 316 283. The adjustable foot disclosed in the latter publication consists of a first adjustable part (2) and a second adjustable part (6) with, at the top, a broadened support part (4) that is concave at the top thereof. The second adjustable part is provided with an external screw thread and the first adjustable part is provided with an internal screw thread, which internal and external screw threads match one another such that when the second adjustable part (6) is turned with respect to the first adjustable part (2) the axial height of these parts with respect to one another is adjusted. On top of the support part (4) there is a washer (7) that is convex on the underside thereof, with a radius of curvature equal to the radius of curvature of the concave top of the support part (4).

Adjustable feet as disclosed in EP 316 283, like adjustable feet according to the present invention, are used when placing pieces of equipment stable and level on a substrate so that, for example, vibration is avoided (consider, for example, washing

machines that are positioned on the substrate by means of adjustable feet so that they are as stable as possible), also so that introducing stresses into the equipment is avoided when tightening anchor bolts for anchoring and also for aligning various pieces of equipment with respect to one another. In the latter case consideration must be given, for example, to a motor that is connected to a powered installation by means of a shaft. When the motor and the powered installation are separate units which usually have to be aligned with one another with regard to the transmission shaft. Adjustable feet are also used for this purpose.

In EP 316 283 holes and 11 are provided in the broadened top section 4 of the second adjustable part 6 for a tool for setting the height of the adjustable foot. A disadvantage of this construction is that with this arrangement the overall height of the adjustable foot is relatively high; after all, the holes 11 have to remain accessible at all times and thus cannot be sunken in the first adjustable part.

A combination according to the preamble of claim 1 is disclosed in DE-2,405,368. According to fig. 1A, this combination comprises a tool rod comprising a gripper member, which is swivable mounted to the tool rod. This gripper member can swivel between a first position and a second position. In the first position the gripper member lies completely inside the cylindrical tool rod. In the second position, the gripper member extends radially from the tool rod in order to engage with a cam on the inside of one of the adjustable parts.

The aim of the present invention is to provide a combination of the type mentioned in the preamble which, in particular, enables the overall height of the adjustable foot to be minimal and is reliable in its use.

The abovementioned aim is achieved according to the invention by providing a combination according to claim 1. This tool thus engages on the second adjustable part in the at least one axial hole. This at least one axial hole is accessible to the tool irrespective of the degree to which the second adjustable part is sunken in the first adjustable part (or, more accurately, has been screwed into the first adjustable part). It will be clear to a person skilled in the art that such a tool interacting with at least one axial hole can be produced in a wide variety of ways. For example, consideration can be given to a hole that runs axially and is provided centrally in the second adjustable part in the form of a blind hole with a slot, hexagonal cavity, square cavity or a cavity that is non-circular in some other way in the bottom, into which cavity a tool with a correspondingly shaped end section at the insertion end can be inserted. However, it is also possible to make two or more eccentric axial holes in the top surface of the second adjustable part or optionally the bottom surface of the second adjustable part, into which holes the insertion end of a tool can be inserted so

as then to be able to turn the second adjustable part by means of this tool. The driver members can then, for example, comprise pins that are inserted by radial spreading into the blind holes provided in the interior peripheral surface of the hole.

According to an advantageous embodiment of the invention the gripper means are
5 equipped to engage on the interior peripheral surface of the hole. In this context the interior peripheral surface is understood to be the peripheral surface that extends parallel to the axial direction of the hole running axially.

However, on cost grounds it is preferable if the hole has a circular peripheral shape and if the interior peripheral surface of the hole does not require further machining. In this
10 context it is preferable according to the invention if the driver members are clamping members for clamping engagement on the interior peripheral surface of the hole. In this context it must be borne in mind that relatively little force is needed for turning the second adjustable part with respect to the first adjustable part if this turning takes place essentially in the non-loaded state. The clamping members for clamping engagement will then
15 relatively easily be able to have adequate grip on the interior peripheral surface of the hole via frictional force.

However, according to the invention it is also very readily possible that the hole at least partially has a non-circular peripheral shape and that the gripper means have a gripper head that can be accommodated with a tight fit in the non-circular section of the hole. This
20 can be achieved, for example, by providing the hole, or at least part of the hole, with a square cross-sectional shape. However, this can also be achieved by means of a bore where the axial, cylindrical wall thereof is provided with a slot running axially.

According to a further advantageous embodiment of the invention, the tool furthermore comprises a tensioning pin with a tensioning member, for example a nut, that
25 is able to move along it, wherein the tensioning pin is actively connected to the second support part and the tensioning member is actively connected to the first support part and wherein the gripper means are supported by the first and second support part in such a way that the gripper means undergo a radial movement when the first and second support parts are moved axially with respect to one another. In this way a radially outward movement or
30 radially inward movement of the gripper means can be achieved in a mechanically simple manner depending on the direction in which the tensioning member moves axially along the tensioning pin.

Claims

1. Combination comprising, on the one hand, an adjustable foot for setting up equipment in alignment and, on the other hand, a tool (40, 20) for setting the height of
 5 the adjustable foot,

wherein the adjustable foot comprises:

- a first adjustable part (1) provided with an axial bore with internal screw thread (4);
- a second adjustable part (2) provided with external screw thread (5) matching the internal screw thread (4), which second adjustable part (2), when screwed into the bore,
 10 can be adjusted in the axial direction with respect to the first adjustable part (1) by turning with respect to the first adjustable part (1) and which second adjustable part (2) is provided with at least one hole (18) that runs axially;
- a support part (6), provided on the first adjustable part (1) or second adjustable part (2), and
- 15 • a washer (3),

wherein the washer (3) and the support part (6) are each provided with a convex (66) respectively, concave surface (6), having essentially the same radius (R) of curvature, such that the angle of the washer (3) can be adjusted with respect to the support part (6)

wherein the tool (20, 40) has an insertion end (21) that can be inserted into the hole
 20 (18) in the axial direction and wherein the insertion end (21) is provided with gripper means (43, 23, 22) that are so equipped that, when they engage on the interior of the hole (18) and the insertion end (21) is rotated about the axial axis (52), the second adjustable part (2) also turns,

characterised in that the gripper means comprise driver members (23, 43) that are able
 25 to move back and forth in the radial direction and are fitted distributed around the periphery of the insertion end (21), which driver members (23, 43) are connected via transmission means (25, 26; 41, 42) to operating means (29, 31; 50, 51) for radially expanding and retracting the driver members (23, 43) for engaging on the hole (18), which operating means (29, 31; 50, 51) are provided on the tool (20, 40) and are
 30 located outside the hole (18) when the insertion end (21) has been inserted into the hole (18).

2. Combination according to Claim 1, wherein the gripper means (23, 43) are equipped to engage on the interior peripheral surface of the hole (18).

3. Combination according to Claim 1 or 2, wherein the hole (18) has a circular peripheral shape and wherein the driver members (23, 43) are clamping members for clamping engagement on the interior peripheral surface of the hole (18).

5 4. Combination according to Claim 2, wherein the hole (18) at least partially has a non-circular peripheral shape and wherein the gripper means (23, 43) have a gripper head that can be accommodated with a tight fit in the non-circular section of the hole.

10 5. Combination according to one of Claims 1 - 4, wherein the tool furthermore comprises a tensioning pin (27, 46) with a tensioning member (28, 50) that is able to move along it, wherein the tool (20, 40) has a first (25, 41) and second (26, 42) support part for the gripper means (22, 23; 43) at the insertion end, wherein the tensioning pin (27, 46) is actively connected to the second support part (26, 42) and the tensioning member (28, 50) is actively connected to the first support part (25, 41) and wherein the gripper means (22, 23; 43) are supported by the first (23, 41) and second (26, 42) support part in such a way that the gripper means (22, 23; 43) undergo a radial movement when the first (25, 41) and second (26, 42) support parts are moved axially with respect to one another.

20 6. Combination according to Claim 5, wherein the gripper means (43) comprise fingers (22) that run axially, between which one end of the anchor pin (17) can be accommodated, wherein the hole (18) is an axial opening through the second adjustable part (2), wherein the axial opening has a broadened zone that extends from one end of the axial opening in the axial direction and that has a cross-sectional shape which is larger than the cross-sectional shape of the anchor pin (17) to such an extent that the fingers (22) can be inserted therein with one end of the anchor pin (17) between them.

25 7. Combination according to one of the preceding claims, wherein the top of the second adjustable part (2) comprises the support part (6).

8. Combination according to one of the preceding claims, wherein the support part (6) is located completely within a contour determined by the diameter of the external screw thread (5).

30 9. Combination according to Claim 1, wherein the support part (6) is at least partially, preferably completely, sunken in a zone of the second adjustable part (2) that is surrounded by the external screw thread (5).

10. Combination according to one of the preceding claims, wherein, viewed in the axial direction, the height of the second adjustable part (2) is less than or equal to

the height of the first adjustable part (1) and wherein, viewed in the radial direction, the dimensions of the second adjustable part (2) are completely within the contour determined by the external screw thread (5).

5 11. Combination according to one of the preceding claims, wherein the external diameter (C) of the washer (3) is at most equal to the external diameter (B) of the second adjustable part (2).

12. Combination according to one of the preceding claims, wherein the support part (6) has a concave surface and the washer (3) a convex surface (66).

10 13. Combination according to one of the preceding claims, wherein the second adjustable part (2) and the washer (3) are provided with an axial opening for an anchor bolt (17).

14. Combination according to one of the preceding claims, wherein the axial opening through the washer (3) has a diameter (D) that is approximately 32 to 48 % larger than the diameter (E) of the axial opening through the second adjustable part (2).

15 15. Combination according to one of the preceding claims, wherein the axial length of the second adjustable part (2) is equal to or less than the axial height of the first adjustable part (1) and wherein the second adjustable part (2) is provided with external screw thread (5) along its entire axial length and/or the internal screw thread (4) of the axial bore extends over the entire axial height of the first adjustable part (1).

20 16. Combination of an adjustable foot according to one of the preceding claims, further comprising a substructure (16), equipment (14) set up in alignment on said substructure (16), and an anchor bolt (9, 17), wherein the equipment (14) is anchored to the substructure (16) by means of the anchor bolt (9, 17), with the adjustable foot between them.

25 17. Combination according to Claim 16, wherein a bottom surface (8) of the first adjustable part (1) rests on the substructure (16) and wherein the equipment (14) is in contact with the washer (3) or with the cap (11) which, in turn, is in contact with the washer (3).

30 18. Use of a tool as defined in one of Claims 1 - 6 for setting the height of an adjustable foot as defined in one of the preceding claims.